

NON-PUBLIC?: N
ACCESSION #: 8803160229
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Trojan Nuclear Plant PAGE: 1 of 3

DOCKET NUMBER: 05000344

TITLE: Reactor Trip Due to Failed Overpower Delta Temperature Channel
EVENT DATE: 01/08/88 LER #: 88-001-01 REPORT DATE: 03/11/88

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Larry Hinson, Plant Review Board Engineer TELEPHONE #: 503-556-3713

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: IM COMPONENT: AMP MANUFACTURER: H015
REPORTABLE TO NPRDS: Yes

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: On January 8, 1988, the plant was operating at 100% power at normal operating temperature and pressure. At 1506, a reactor trip occurred due to a spurious overpower delta temperature (OPDT) trip signal on one channel which occurred while another OPDT channel was in a tripped state while surveillance testing. At 1518, source range neutron detector N-32 was energized, but no indication was received on this channel of nuclear instrumentation.

The cause of the OPDT channel's spurious trip signal was found to be a failed transistor in the channel's Lead-Lag Amplifier (TY-412D). The source range channel's failure to indicate was due to a reduction in channel signal strength which apparently resulted from formation of an oxide film on the cable connector to the instrument's pre-amplifier.

The faulty transistor in the OPDT amplifier was replaced. The connector to the source range instrument's pre-amplifier was cleaned.

This event had no impact on public health and safety.

(End of Abstract)

Description of Event

On January 8, 1988, the plant was operating at 100% power at normal operating temperature (585 degrees F) and pressure (2235 psig). Periodic Instrument and Control Test (PICT) 6-4, "Reactor Delta Temperature and Average Temperature, Protection Set IV", was in progress.

At 1506, a reactor trip occurred due to an overpower delta temperature (OPDT) trip signal. One channel of OPDT was in the tripped condition as a result of the PICT 6-4 surveillance testing in progress. A second OPDT channel received an intermittent and spurious trip signal which completed the two out of four logic necessary for a reactor trip. Cause of the spurious OPDT trip signal could not be immediately identified via troubleshooting due to the intermittent nature of the fault. On January 9 at 0605, indication of a loop 'A' OPDT reactor trip and rod block was received. Further investigation revealed a failed transistor in Lead Lag Amplifier TY-412 D of the loop 'A' OPDT logic circuit.

At 1518 on January 8, source range neutron detector N-32 was energized but no indication was received on this nuclear instrumentation channel. The cable connector to the instrument's pre-amplifier was temporarily disconnected and cleaned to remove an oxide film. Indication from source range detector N-32 was restored at 1616. The detector was demonstrated operable by satisfactory completion of its surveillance test at 1641.

Cause of Occurrence

The cause of the reactor trip was a spurious trip signal from loop 'A' OPDT which occurred while a second OPDT channel was in the tripped condition during surveillance testing. The spurious OPDT trip signal was caused by a failed transistor in Lead-Lag Amplifier TY-412D. A review of machinery history revealed no similar failure of lead-lag modules. The transistor was believed to have failed randomly due to equipment aging.

The N32 detector's source range channel failed to indicate due to lack of an adequate signal. Formation of an oxide film on the cable connector to the instrument's pre-amplifier apparently caused a reduction in channel signal strength. Other factors, however, such as aging source range cabling or a less than optimum discriminator curve setting could have contributed to the problem.

Corrective Action

The immediate corrective action following the reactor trip was to carry out

the emergency instruction recovery actions and to restore the OPDT channel under test to operation. Surveillance testing was performed on each OPDT channel in an attempt to discover the faulty channel without success. The OPDT channel for loop 'A' failed the next day while troubleshooting continued, and tripped its associated reactor trip and rod block bistables. Diagnostics of this channel revealed a failed transistor in Lead-Lag Amplifier TY-412D. The failed transistor was replaced, instrumentation in the associated loop was calibrated, and surveillance testing was satisfactorily performed to restore the loop 'A' OPDT channel to operable status.

TEXT: PAGE: 3 of 3

Corrective action taken to restore indication from source range detector N-32 was to clean the cable connector to the instrument's pre-amplifier and perform the surveillance to demonstrate instrument operability. This cable connector will be cleaned at least once per year during the performance of annual source range instrument testing. The cabling for source range detector N32 will be replaced by the end of the 1989 refueling outage. A discriminator curve for source range detector N32 will be plotted during the 1988 refueling outage in order to evaluate and optimize detector performance.

Significance of Occurrence

This event had no effect on public health and safety. There was no actual plant condition requiring a reactor trip; however, the reactor protection system functioned as designed to trip the reactor on receipt of a trip signal from two channels of OPDT.

ATTACHMENT # 1 TO ANO # 8803160229 PAGE: 1 of 1

PGE

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US Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Gentlemen:

Licensee Event Report No. 88-01, Revision 1, is attached. This report updates an event in which a reactor trip occurred due to a spurious overpower delta temperature (OPDT) trip signal on one channel which occurred while another

OPDT channel was in a tripped state while surveillance testing.

Sincerely,
/s/ C. A. Olmstead
C. A. Olmstead
General Manager
Trojan Nuclear Plant

c: Mr. John B. Martin
Regional Administrator
US Nuclear Regulatory Commission

Mr. William Dixon
State of Oregon
Department of Energy

Mr. R. C. Barr
USNRC Resident Inspector
Trojan Nuclear Plant

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